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ABSTRACT

This study tests the general hypothesis that preschool experience has a measurable effect upon children's noncognitive development between the time they enter and the time they leave the preschool program. The California Preschool Competency Scale (CPSCS) was administered to 4-year-old children in a prekindergarten program (PreK) in the fall of 1975 and to a sample of 1,402 of the children in the spring of 1976. It had previously been shown that the CPSCS breaks down into five dimensions when the item scores are factor analyzed. The factors were labeled Considerateness, Task Orientation, Extraversion, Verbal, and Response to the Unfamiliar. Five predictor variables were selected. The predictor variable of main interest, exposure to PreK, was differentiated from two other variables, total scheduled time in preschool and total calendar days from program entry to time of rating. Age and mother's education were employed as control variables. A multiple linear regression approach was used to identify relations between factors and predictor variables. Neither Considerateness nor Response to the Unfamiliar had any significant relationship to any of the five predictor variables. The control variables accounted for nearly all of the variance in the Task Orientation factor. A positive relationship did appear between exposure to PreK and the spring 1976 ratings on extraversion and, to a larger extent, verbal competence. It is concluded that the analysis has isolated the areas of social competency on which PreK has an effect. (Author/RH)

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EFFECTS OF EXPOSURE TO PREKINDERGARTEN ON FIVE SOCIAL COMPETENCY FACTORS

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EFFECTS OF EXPOSURE TO PREKINDERGARTEN ON FIVE SOCIAL COMPETENCY FACTORS

THE PROBLEM

As part of a longitudinal evaluation of the New York State Experimental Prekindergarten Program (PreK), the California Preschool Social Competency Scale (California) was administered to about 5,000 four-year-old children in the fall of 1975 and to a sample of the children in the spring of 1976. The research hypothesis to be tested was that PreK has a measurable effect upon children's noncognitive development between the time they enter and leave the program. This hypothesis is based on a broader question stated in the Evaluation Design: New York State Experimental Prekindergarten Program (September 3, 1975). The California scale was selected as one measure of this noncognitive development.

Hick, Kukuk, Horan, Irvine and Flint (1978) found that exposure to PreK had a positive effect on the development of social competency in children as measured by the California scale. The effect was most pronounced for children who received up to 600 hours of exposure to the program; beyond that, exposure time produced no additional benefit. The proportion of shared variance (R^2) accounted for by the regression model which illustrates this effect is .07.

Flint, Hick, Horan, Irvine and Kukuk (1978) showed that the California scale breaks down clearly into five dimensions when the item scores are factor analyzed. A principal components analysis with varimax rotation produced five orthogonal factors, which accounted for about 60 percent of the variance in the scale. Examination of the content of the items loading on each factor led to the labelling

of these factors as shown in Table 1. The percentage of variance accounted for by each factor is also given in this table. The present paper will seek to refine the findings of Hick et al. (1978) using the five factors separately as criterion variables instead of one global California score.

Table 1
California Factors and Percentage of Variance Accounted For

Factor	Percentage of Variance
1. Considerateness	16.2
2. Task Orientation	14.0
3. Extraversion	11.5
4. Verbal	10.2
5. Response to Unfamiliar	7.9

Factor scores were computed based on the rotated factors of the principal components solution described by Flint et al. (1978). Cases with missing data on any item in the California scale were dropped, so that the present study sample of 1,402 is smaller than that of the Hick et al. (1978) study by 123 cases. This 8 percent decrease did not appear to affect the sample characteristics under study, as the means and standard deviations of the predictor variables reported by Hick are almost identical to those shown here in Table 2.

Table 2
Descriptive Statistics for Prekindergarten Children
on Five Factors and Five Predictor Variables
n=1402

Factor/Predictor Variable	Mean	S.D.	Minimum	Maximum
Considerateness	0.0	1.0	-3.8	2.3
Task Orientation	0.0	1.0	-4.0	2.7
Extraversion	0.0	1.0	-3.3	3.4
Verbal	0.0	1.0	-5.4	2.4
Response to Unfamiliar	0.0	1.0	-4.2	3.0
Exposure Time in hours	345	200	10	1386
Scheduled Time in hours	406	216	25	1494
Duration in days	246	19	94	286
Age in days	1560	111	1011	2082
Mother's Education in years	10.9	2.5	0.0	18.0

Table 3 shows the correlations among the five criterion variables and the five predictor variables. There is, of course, no significant correlation among the criterion variables, which are orthogonal factor scores. Between the time variables and the criteria, the Verbal factor correlates most highly with exposure time. Extraversion and Considerateness have a lower correlation with exposure time; direction is positive for Extraversion and negative for Considerateness.

Table 3
Intercorrelations of Five Factor Scores and Five Predictor Variables

		2	3	4	5	6	7	8	9	10
1.	Considerateness	-.00	-.00	.01	-.01	-.07	-.09	.00	-.01	-.01
2.	Task Orientation		-.00	-.01	.01	.02	.01	-.02	.13	.11
3.	Extraversion			-.00	-.01	.08	.07	-.02	.04	.05
4.	Verbal				-.00	.17	.15	.05	.07	.27
5.	Response to Unfamiliar					-.02	-.02	-.02	-.03	.07
6.	Exposure Time						.96	.13	.01	.13
7.	Scheduled Time							.11	.00	.09
8.	Duration								-.08	.05
9.	Age									-.00
10.	Mother's Education									

METHOD

The method of analysis followed by Hick et al. (1978) was repeated here. This method entails a multiple linear regression approach to test hypotheses of interest. A full model (FULL) is generated, which includes all of the predictor information; a restricted model (REST) is then generated, which leaves out some of

the information in the predictor set. The difference between the R^2 of these two models is then tested by the F statistic to give an indication of the significance of the information which was left out in the restricted model. If the difference is not significant, the restricted model becomes the full model and is in turn compared with a new restricted model which expresses a new hypothesis of interest. Models are thus successively reduced until a final model is obtained which contains only the essential variables.

In the present analysis, instead of using the total California score as the criterion variable, the five factor scores were used separately as the criterion variable in five separate analyses. The starting model for each analysis was the same as that used by Hick et al. (1978), which included the following predictor variables:

E = Time in hours the child was exposed to PreK, divided by 100.

S = Time in hours the child was scheduled, divided by 100.

D = Duration in calendar days from entry into the program to the date the child was rated on the California, divided by 100.

A = Age in days at the time of entry into PreK minus 1000, divided by 100.

M = Years of Mother's Education.

Also included were combinations of these variables to provide for the possibility of third degree curvilinearity for exposure time, scheduled time and duration; and interactions among these variables, including two curvilinear interactions. Age and mother's education were included as control variables.

RESULTS

Considerateness

Considerateness was the criterion variable for the first analysis. All of the variables included in the starting model are shown as vectors in Table 4. The raw regression weights are shown in model 1, the starting model. No other models are shown in this table because the starting model was immediately reduced to a model containing only the unit vector. The first hypothesis tested was the hypothesis of no effects (Hypothesis 1) to determine whether there was any significant relationship at all between the criterion, Considerateness, and all of the predictor variables taken together.

HYPOTHESIS 1: There is no effect of any of the variables.

FULL (1) R^2 = .0131, 17 liv*

REST (50) R^2 = .0000, 1 liv

F = 1.15 with 16/1385 df, P = .305

Result: Retain the hypothesis.

Since the hypothesis was retained, the analysis stopped here. There is no significant relationship between Considerateness and the predictor variables.

Task Orientation

The second analysis examined Task Orientation as the criterion variable. The models and weights are shown in Table 5. Model reduction began again by testing the hypothesis of no effects (Hypothesis 1).

*Linearly independent vectors. Refer to Table 4 to determine which vectors are included in the model.

Table 4
Regression Weights for Model 1 in 'Considerateness' Analysis

	Vectors															
Model	U*	E	E^2	E^3	S	S^2	S^3	D	D^2	D^3	ED	SD	ES	ED^2	SD^2	A	M
1	.04	-.37	-.03	.00	-.04	.04	-.00	.25	.03	-.04	.25	-.03	-.02	.01	-.03	.01	-.00

Table 5
Regression Weights for Models in 'Task Orientation' Analysis

	Vectors																
Model	U*	E	E^2	E^3	S	S^2	S^3	D	D^2	D^3	ED	SD	ES	ED^2	SD^2	A	M
1	-2.25	-.41	-.04	.00	.06	.08	-.00	1.2	.00	-.09	.00	.00	-.02	.12	-.09	.12	.04
2	- .68	-.57	-.02	.00	.19	.07	-.00	.89	.00	-.07	.00	.00	-.02	.14	-.11		
3	-1.61	-.45	-.03	.00	.09	.08	-.00	1.0	.00	-.08	.00	.02	-.02	.13	-.11	.12	
4	-1.09	-.27	-.05	.00	-.09	.09	-.00	.93	.00	-.08	.00	.00	-.01	.10	-.07		.04
5	-1.74	.22	-.04	.00	-.40	.06	-.00	.77	.00	-.06						.12	.04
6	- .93	.06			-.06			-.08								.12	.04
7	-1.13	.06			-.05											.12	.04
8	-1.17	.00														.12	.04
9	-1.17															.12	.05

*U is the unit vector.

Abbreviations:

U = Unit vector. E = Exposure time. S = Scheduled time. D = Duration. A = Age. M = Mother's education.

HYPOTHESIS 1: There is no effect of any of the variables.

FULL (1) R^2 = .0410, 17 liv

REST (50) R^2 = .0000, 1 liv

F = 3.7 with 16/1385 df, P = .0000

Result: Reject the hypothesis.

There is a significant relationship between Task Orientation and the predictor variables taken together. The next step in the model reduction process was to check on the effect of the control variables, Age and Mother's Education. The effect of eliminating both of these variables simultaneously was tested by Hypothesis 2.

HYPOTHESIS 2: There is no effect of control variables, age and mother's education.

FULL (1) R^2 = .0410, 17 liv

REST (2) R^2 = .0142, 15 liv

F = 19.3 with 2/1385 df, P = .0000

Result: Reject the hypothesis.

At least one of the control variables must be significant. The effect of mother's education in the presence of Age was tested next.

HYPOTHESIS 3: There is no effect of mother's education.

FULL (1) R^2 = .0410, 17 liv

REST (3) R^2 = .0308, 16 liv

F = 14.7 with 1/1385 df, P = .0001

Result: Reject the hypothesis.

Mother's education accounted for 1 percent of the variance in the Task Orientation factor, a significant proportion, indicating that mother's education should be retained as a control variable.

The other control variable, Age, was then tested in the presence of mother's education.

HYPOTHESIS 4: There is no effect of age.

FULL (1) R^2 = .0410, 17 liv

REST (4) R^2 = .0240, 16 liv

F - 24.5 with 1/1385 df, P = .0000

Result: Reject the hypothesis.

Age accounted for almost 2 percent of the Task Orientation variance, again a significant proportion, so both mother's education and age are retained in all subsequent models as control variables.

The starting model has not yet been reduced. The next step was to test the hypothesis of no interaction among the predictor variables.

HYPOTHESIS 5: There is no interaction.

FULL (1) R^2 = .0410, 17 liv

REST (5) R^2 = .0373, 12 liv

F = 1.06 with 5/1385 df, P = .3826

Result: Retain the hypothesis.

At this point, Model 5 became the full model. With the interaction terms eliminated, the question of curvilinearity in the effects was addressed next. Hypothesis 6 states that no curvilinearity is involved.

HYPOTHESIS 6: There is no curvilinearity.

FULL (5) R^2 = .0373, 12 liv

REST (6) R^2 = .0314, 6 liv

F = 1.42 with 6/1390 df, P = .2035

Result: Retain the hypothesis.

The model has now been reduced to one with simple linear effects. It remained to determine whether the variables Duration and Scheduled Time added anything significant to the relationship with Task Orientation. The first of these tested was Duration.

HYPOTHESIS 7: There is no effect of duration.

FULL (6) R^2 = .0314, 6 liv

REST (7) R^2 = .0312, 5 liv

F = .3195 with 1/1396 df, P = .5720

Result: Retain the hypothesis.

Duration adds nothing of significance to the relationship and so is dropped from the analysis. The effect of Scheduled Time was tested next.

HYPOTHESIS 8: There is no effect of scheduled time.

FULL (7) R^2 = .0312, 5 liv

REST (8) R^2 = .0301, 4 liv

F = 1.65 with 1/1397 df, P = .1995

Result: Retain the hypothesis.

Scheduled Time also fails to add to the relationship and is likewise dropped. The only variable not tested at this point was Exposure Time. Its effect was tested by Hypothesis 9.

HYPOTHESIS 9: There is no effect of exposure time.

FULL (8) R^2 = .0301, 4 liv

REST (9) R^2 = .0300, 3 liv

F = .036 with 1/1398 df, P = .8500

Result: Retain the hypothesis.

Exposure time does not account for any significant amount of variance in the Task Orientation factor not already accounted for by Age and Mother's Education. These two variables are the only predictor variables remaining in Model 9, the final model. This model covers three percent of the variance in Task Orientation. Of this, Mother's Education accounts for about one percent and Age accounts for about two percent.

Extraversion

The Extraversion factor of the California scale was the criterion variable in the third analysis. The models used in this analysis, along with the regression weights for the predictor variables, are listed in Table 6. Again, the first hypothesis tested was that of no effects.

HYPOTHESIS 1: There is no effect of any of the variables.

FULL (1) R^2 = .0250, 17 liv

REST (50) R^2 = .0000, 1 liv

F = 2.22 with 16/1385 df, P = .0036

Result: Reject the hypothesis.

The next step was to determine whether the control variables, Age and Mother's Education, could be eliminated.

HYPOTHESIS 2: There is no effect of the control variables, age and mother's education.

FULL (1) R^2 = .0250, 17 liv

REST (2) R^2 = .0210, 15 liv

F = 2.84 with 2/1385 df, P = .0587

Result: Retain the hypothesis.

Table 6
Regression Weights for Models in 'Extraversion' Analysis

	Vectors															
Model	U	E	E^2	E^3	S	S^2	S^3	D	D^2	D^3	ED	SD	ES	ED^2	SD^2	A	M
1	-1.88	.06	-.05	.00	-.14	-.00	-.00	.96	.27	-.19	-.02	.00	.05	.04	-.00	.03	.02
2	-1.34	.08	-.05	.00	-.18	.00	-.00	1.02	.14	-.15	.00	.00	.05	.03	.00		
3	-1.64	.24	-.01	-.00	-.09	.00	.00	1.01	.05	-.10							
4	.33	.10			-.05			-.19									
5	-2.10	.27	-.02		-.12	.00		1.92	-.48								
6	.09	.26	-.01		-.09	.00		-.18									
7	.05	.23	-.01		-.06			-.17									
8	-.37	.23	-.01		-.06												
9	-.39	.16	-.01														

Abbreviations: See Table 5.

The contribution of Age and Mother's Education to R^2 was not significant, and they were dropped from the model. The hypothesis of no interaction effects was tested next.

HYPOTHESIS 3: There is no interaction.

FULL (2) R^2 = .0210, 15 liv

REST (3) R^2 = .0174, 10 liv

F = 1.02 with 5/1387 df, P = .4069

Result: Retain the hypothesis.

There is no interaction among the predictor variables. The next step in the reduction process was to eliminate the curvilinearity terms if possible.

HYPOTHESIS 4: There is no curvilinearity.

FULL (3) R^2 = .0174, 10 liv

REST (4) R^2 = .0083, 4 liv

F = 2.15 with 6/1392 df, P = .0457

Result: Reject the hypothesis.

At least one of the predictor variables has a curvilinear relationship with Extraversion. The degree of curvilinearity is not certain. The next hypothesis sought to eliminate all third degree curvilinearity.

HYPOTHESIS 5: There is no third degree curvilinearity.

FULL (3) R^2 = .0174, 10 liv

REST (5) R^2 = .0170, 7 liv

F = .17 with 3/1392 df, P = .9156

Result: Retain the hypothesis.

With third degree curvilinearity eliminated, it remained to determine which variables, if any, might have a curvilinear effect. Duration was examined first.

HYPOTHESIS 6: There is no curvilinear effect of duration.

FULL (5) R^2 = .0170, 7 liv

REST (6) R^2 = .0144, 6 liv

F = 3.74 with 1/1395 df, P = .0533

Result: Retain the hypothesis.

Duration has no curvilinear effect. The next test was to determine whether Scheduled Time does.

HYPOTHESIS 7: There is no curvilinear effect of scheduled time.

FULL (6) R^2 = .0144, 6 liv

REST (7) R^2 = .0143, 5 liv

F = .19 with 1/1396 df, P = .6656

Result: Retain the hypothesis.

It has no been determined that neither Duration nor Scheduled Time has a curvilinear effect. Since we know from the test of Hypothesis 4 that a curvilinear effect exists, it must be in Exposure Time. At this point, then, it has been determined that there is an effect of Exposure Time on Extraversion, and that this effect is a second degree curvilinear one. It may be possible, however, to reduce the model further, since the simple linear effects of Duration and Scheduled Time have not yet been tested. The next two hypotheses do this.

HYPOTHESIS 8: There is no effect of duration.

FULL (7) R^2 = .0143, 5 liv

REST (8) R^2 = .0133, 4 liv

F = 1.44 with 1/1397 df, P = .2297

Result: Retain the hypothesis.

The contribution of duration is not significant and it was dropped from the model. The effect of Scheduled Time was tested next.

HYPOTHESIS 9: There is no effect of scheduled time.

FULL (8) R^2 = .0133, 4 liv

REST (9) R^2 = .0120, 3 liv

F = 1.77 with 1/1398 df, P = .1833

Result: Retain the hypothesis.

Scheduled Time also contributes nothing of significance. The model cannot be reduced further. The final model, Model 9, contains only Exposure Time as a predictor variable, with a second degree curvilinear effect on the Extraversion factor. This relationship is plotted in Figure 1. It is positive up to about 700 hours of Exposure Time. Beyond that the relationship is sharply negative. The mean exposure time, however, is 345 hours, with a standard deviation of 200 hours; so that almost all of the observed cases are included in the upward slope of the curve. In general, then, it can be said that children who have more exposure to the PreK program tend to score higher on the Extraversion factor of the California Scale. The relationship is a subtle one, however, since this model accounts for only a little more than one percent of the variance in the Extraversion factor.

Verbal

In the fourth analysis the Verbal factor of the California Scale was used as the criterion variable. Table 7 lists the models and weights used in this analysis. The hypothesis of no effects was tested first.

HYPOTHESIS 1: There is no effect of any of the variables.

FULL (1) R^2 = .1172, 17 liv

REST (50) R^2 = .0000, 1 liv

F = 11.5 with 16/1385 df, P = .0000

Result: Reject the hypothesis.

There is a significant relationship between the Verbal factor and the predictor set. Model reduction again began by testing the elimination of Age and Mother's Education.

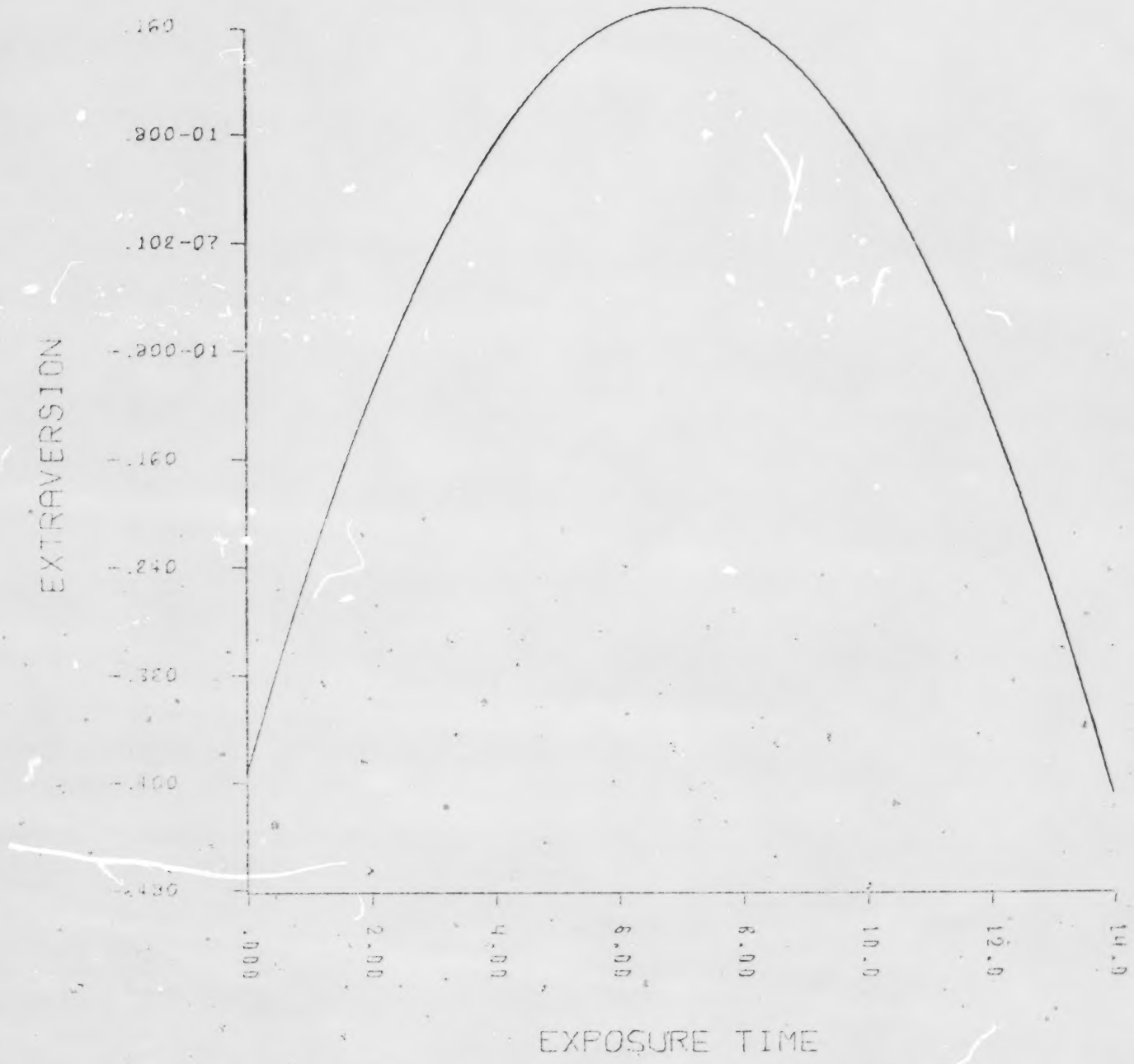

Figure 1. The effect of exposure time on the extraversion factor of the California scale.

Table 7
Regression Weights for Models in 'Verbal' Analysis

	Vectors															
Model	U	E	E^2	E^3	S	S^2	S^3	D	D^2	D^3	ED	SD	ES	ED^2	SD^2	A	M
1	-.95	-1.03	.01	-.00	.84	-.03	.00	-1.14	-.06	.13	.47	.00	-.02	.03	-.13	.06	.10
2	.08	-.44	.01	-.00	.94	-.03	.00	-.97	-.05	.13	-.15	.02	-.01	.19	-.17		
3	-.37	-.42	.01	-.00	.90	-.02	.00	-.96	-.03	.13	-.10	.01	-.01	.17	-.16	.06	
4	-.59	-1.09	.01	-.00	.95	-.03	.00	-1.08	-.08	.13	.47	-.07	-.02	.03	-.12		.10
5	-.69	.26	-.00	-.00	.05	-.03	.00	-1.12	-.00	.09						.07	.10
6	-2.07	.09			-.03			.15								.06	.10
7	-.18	.33	-.02		-.09	.00		-1.03	.48							.06	.10
8	-2.39	.32	-.02		-.10	.01		.15								.07	.10
9	-.18	.28	-.02		-.04			-1.98	.49							.06	.10
10	-.52	.10			-.03			-1.29	.33							.06	.10
11	-.25	.24	-.02					-1.94	.49							.06	.10

Table 8
Regression Weights for Model 1 in 'Response to Unfamiliar' Analysis

	Vectors															
Model	U	E	E^2	E^3	S	S^2	S^3	D	D^2	D^3	ED	SD	ES	ED^2	SD^2	A	M
1	-.92	.40	.02	-.00	-.10	-.07	.00	.49	.01	-.04	-.09	-.00	.04	-.05	.05	.02	.03

Abbreviations: See Table 5.

HYPOTHESIS 2: There is no effect of control variables, age and mother's education.

FULL (1) R^2 = .1172, 17 liv

REST (2) R^2 = .0536, 15 liv

F = 49.8 with 2/1385 df, P = .0000

Result: Reject the hypothesis.

There is a significant contribution to R^2 from the two control variables. The effect of mother's education was then tested separately.

HYPOTHESIS 3: There is no effect of mother's education.

FULL (1) R^2 = .1172, 17 liv

REST (3) R^2 = .0584, 16 liv

F = 92.2 with 1/1385 df, P = .0000

Result: Reject the hypothesis.

Mother's education accounts for about 6 percent of the variance in the Verbal factor. The effect of Age was tested next.

HYPOTHESIS 4: There is no effect of Age.

FULL (1) R^2 = .1172, 17 liv

REST (4) R^2 = .1122, 16 liv

F = 7.81 with 1/1385 df, P = .0053

Result: Reject the hypothesis.

Age adds about one-half percent to the R^2, a small but significant proportion. Both control variables remain in the model. The next step was to test for interaction effects among the predictor variables.

HYPOTHESIS 5: There is no interaction.

FULL (1) R^2 = .1172, 17 liv

REST (5) R^2 = .1124, 12 liv

F = 1.5 with 5/1385 df, P = .1868

Result: Retain the hypothesis.

The interaction terms were eliminated from the model, and the next step was to test for curvilinearity.

HYPOTHESIS 6: There is no curvilinearity.

FULL (5) R^2 = .1124, 12 liv

REST (6) R^2 = .0982, 6 liv

F = 3.71 with 6/1390 df, P = .0012

Result: Reject the hypothesis.

There is curvilinearity in the data and it remains to determine at what level and where it occurs. First, all of the third degree terms were tested.

HYPOTHESIS 7: There is no third degree curvilinearity.

FULL (5) R^2 = .1124, 12 liv

REST (7) R^2 = .1104, 9 liv

F = 1.01 with 3/1390 df, P = .3858

Result: Retain the hypothesis.

The curvilinearity is restricted to second degree. The next test was to determine whether this curvilinearity occurs in the Duration variable.

HYPOTHESIS 8: There is no curvilinearity in duration.

FULL (7) R^2 = .1104, 9 liv

REST (8) R^2 = .1079, 8 liv

F = 3.93 with 1/1393 df, P = .0476

Result: Reject the hypothesis.

Duration has a second degree curvilinear effect on the Verbal factor. The curvilinearity of Scheduled Time was tested next.

HYPOTHESIS 9: There is no curvilinearity in scheduled time.

FULL (7) R^2 = .1104, 9 liv

REST (9) R^2 = .1101, 8 liv

F = .51 with 1/1393 df, P = .4744

Result: Retain the hypothesis.

The curvilinearity does not occur in Scheduled Time. The test of curvilinearity in Exposure Time was next.

HYPOTHESIS 10: There is no curvilinearity in exposure time.

FULL (9) R^2 = .1101, 8 liv

REST (10) R^2 = .0994, 7 liv

F = 16.7 with 1/1394 df, P = .0001

Result: Reject the hypothesis.

The curvilinear effect occurs in both Duration and Exposure Time. Whether the Scheduled Time variable has any effect at all had not yet been tested, and this was done with the next hypothesis.

HYPOTHESIS 11: There is no effect of scheduled time.

FULL (9) R^2 = .1101, 8 liv

REST (11) R^2 = .1095, 7 liv

F = .91 with 1/1394 df, P = .3413

Result: Retain the hypothesis.

Scheduled Time makes no significant contribution and can be eliminated from the model. There is no need to go further. It has been established that Exposure Time and Duration have a second degree curvilinear relationship with the Verbal

factor regardless of levels of child's age and mother's education. Model 11 is the final model; it accounts for 11 percent of the variance in the Verbal factor. This model is plotted in Figure 2, using fixed levels of Age (4 years, 3 months) and Mother's Education (11 years). This figure covers the major portion of the available data with only 50 cases lying beyond the limits drawn. It is apparent that at any level of duration, children who have been exposed longer to the PreK program tend to score higher on the Verbal factor of the California Social Competency Scale. This effect diminishes beyond 700 hours of exposure time, but there are few cases beyond that point.

Response to the Unfamiliar

The final analysis examined the factor, Response to the Unfamiliar, as the criterion variable. Higher scores on this factor indicate greater adaptability and less insecurity in the face of unfamiliar situations. The starting model and weights produced in this analysis are listed in Table 8. The first hypothesis tested was that of no effects.

HYPOTHESIS 1: There is no effect of any of the variables.

FULL (1) R^2 = .0162, 17 liv

REST (50) R^2 = .0000, 1 liv

F = 1.42 with 16/1385 df, P = .1221

Result: Retain the hypothesis.

Here again, as with the Considerateness factor, there is no significant relationship with the predictor variables and the criterion. Accordingly, the analysis stops here.

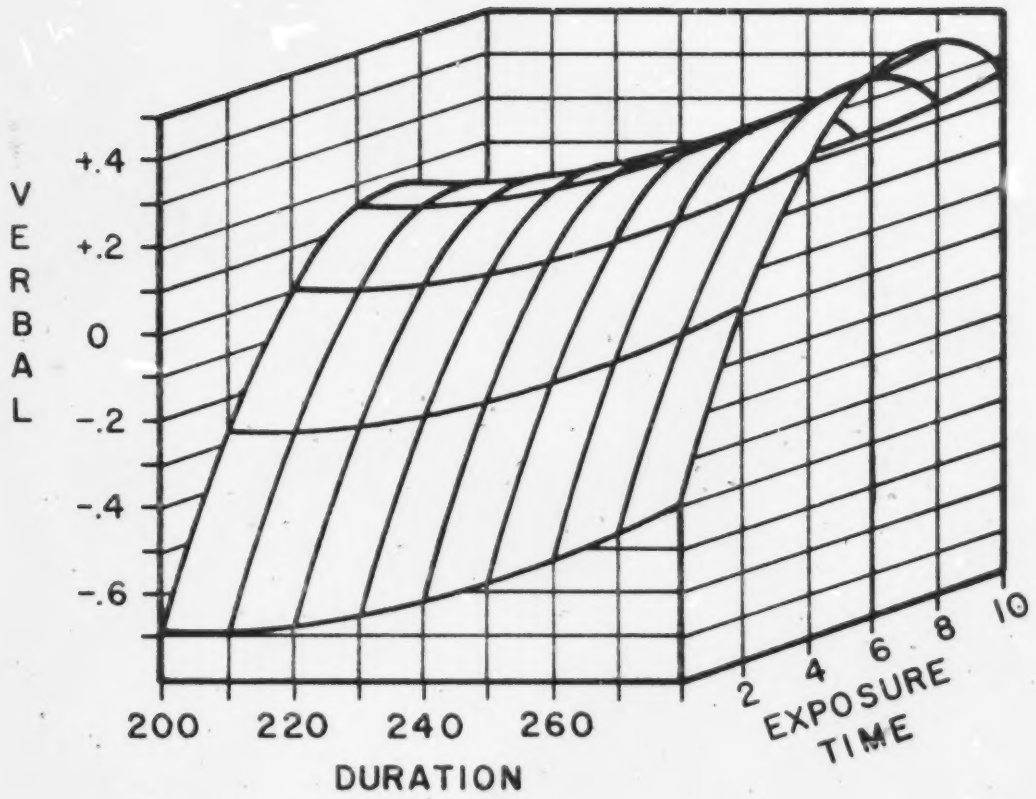

Figure 2. The effect of duration and exposure time on the verbal factor of the California scale.

SUMMARY

When total scores on the California Preschool Social Competency Scale were replaced by factor scores derived through principal components analysis, it was found that Exposure Time has no significant relationship with three of the components of the scale: Considerateness, Task Orientation and Response to the Unfamiliar. Exposure time does have a curvilinear and generally positive relationship with the Extraversion component. This is a subtle relationship with an R^2 of only .012. With the Verbal component, Exposure time has also a curvilinear, and again, generally positive relationship, with an R^2 of .11. This represents an increase of .042 over the R^2 of the final model in the analysis which used the total California score as the criterion, which had an R^2 of only .068.

There does appear then to be a positive relationship between the time children spend in the program and their rating on the California Preschool Social Competency Scale at the end of the program. The relationship is restricted, however, to those parts of the scale that measure extraversion and, to a larger extent, verbal competence. This verbal competence is indicated by rated behaviors such as using names of others, identifying self, making explanations to other children, reporting accidents, communicating wants, and following and remembering verbal instructions.

The decomposition of the total California score into its principal components, and the use of these components as criterion variables in regression analysis has isolated the areas of social competency on which PreK has an effect. Moreover, the strength of the effect on verbal social competency has been found to be greater than the previously found effect on overall social competency as measured by the total scale score.

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